

NOTICE

All drawings located at the end of the document.

QUARTERLY REPORT

FOR JULY THROUGH SEPTEMBER 1993

OPERABLE UNIT #1
IM/IRA TREATMENT FACILITY

PREPARED BY

ENVIRONMENTAL RESTORATION
FACILITIES OPERATIONS MANAGEMENT

EG&G ROCKY FLATS
GOLDEN COLORADO

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ADMIN RECORD

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1 0 INTRODUCTION

The Operable Unit No 1 (OU 1) water treatment facility located in Building 891 is responsible for treating groundwater collected from the 881 Hillside area. The water is collected in a french drain located on the 881 hillside and pumped to the influent storage tanks located at Building 891 (see Figure 1). Next the water is treated with an ultraviolet light/hydrogen peroxide system (for removal of volatile organic compounds) and a four step ion exchange system (for removal of uranium, total dissolved solids (TDS), total suspended solids, cations, anions, and selected metals). After treatment the water is stored in one of three effluent storage tanks until laboratory sample results verify that the water is acceptable for discharge into the South Interceptor Ditch (SID).

2 0 INFLUENT WATER CHARACTERISTICS

Influent water for the treatment facility comes from three different sources on the 881 Hillside. These sources include the 881 footing drain, the recovery well CW001 (located upgradient of the french drain), and groundwater intercepted by the french drain. Water from the footing drain flows by gravity into the french drain, mixes with groundwater, and collectively flows by gravity towards the french drain sump. Recovery well water is pumped directly into the french drain sump and mixed with the groundwater/footing drain water. The combined water is then pumped from the french drain sump into the treatment system influent holding tanks.

2 1 INFLUENT FLOW RATES

The recovery well pump operated for 15 minutes during the past quarter. It was estimated (using the pump curve) from this pumping time that approximately 75 gallons of water were pumped from the recovery well during the second quarter.

The 881 footing drain flowmeter was damaged by high flowrates in the early portion of the quarter and remained inoperable for several weeks. The meter was reinstalled with additional supports in the middle of the quarter. Equipment necessary to obtain data from the flowmeter was not available at the time of reinstallation. Therefore, after several weeks of data collection, the system ran out of memory and one week of data was lost. The system was then reprogrammed to produce less hardcopy output and extend the memory span. All problems with the flowmeter appear to be resolved and no further difficulties are expected. Average daily flowrates ranged from 1.9 GPM to 7.0 GPM at peak flowrates (see Figure 2). The total flow from 8/10/93 to 10/7/93 (one week's data was estimated) was approximately 300,000 gallons.

The repaired influent flow totalizer was reinstalled to assist in estimating the influent flow to the system. After collecting several days worth of data, it was found that the totalizer recorded only a fraction of the measured influent tank volume differential. Based on this data, the totalizer reading was established as an unreliable source of information. Magnetic flowmeters have been ordered and will be installed during the

FOOTING DRAIN FLOWRATES

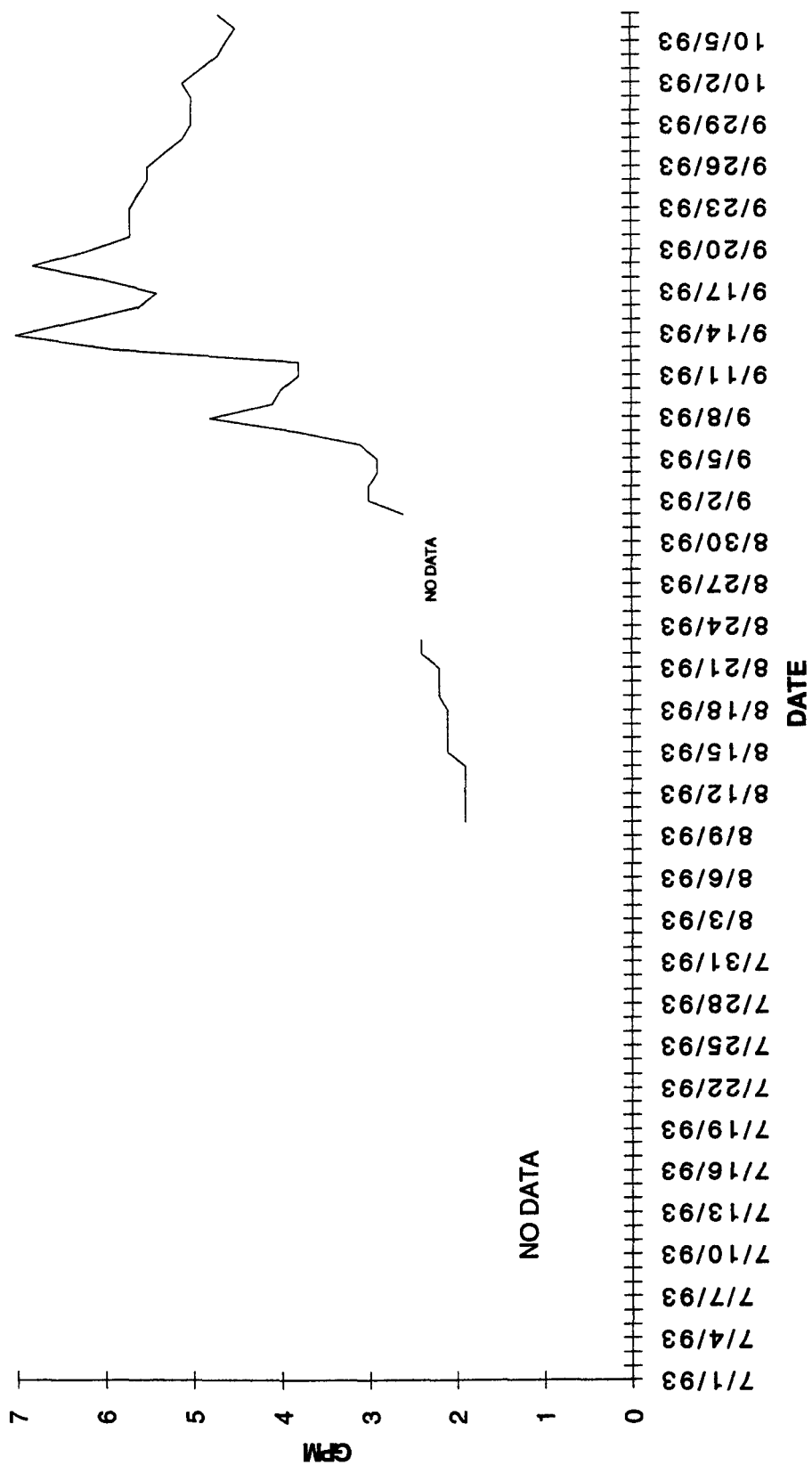


FIGURE 2

first quarter of 1994. These flowmeters will provide more accurate information on the influent flow to the system.

2.2 INFLUENT CONTAMINANTS

A summary of contaminants from each of the three hillside sample locations (881 footing drain, french drain sump, and the recovery well) for April through September 1993 is found in Figures 3, 4, and 5 respectively. Total Dissolved Solids (TDS) results are greater than the ARAR of 400 mg/l for all samples taken at these locations.

Currently, samples taken for metals at the hillside locations and within the treatment facility are for total metals. However, total metals results are not always useful when comparing the results to ARARs which have been developed as dissolved values. Therefore, samples taken during the next quarter will be for both dissolved and total metals. This data will then be used to determine the best course of action for future sample activities.

Only one additional parameter was above the ARAR at the footing drain location. Methylene Chloride was detected at 28 µg/l (ARAR is 5 µg/l). However, a B qualifier was indicated on the results, indicating that the compound was also found in the laboratory's blank. Therefore, it is not certain that this compound was actually present in the sample.

Fewer samples are taken at the recovery well because there is not always enough water available to perform sampling. Three parameters (other than TDS) were detected above ARAR at this location. Total selenium was found at levels significantly above the ARAR for dissolved selenium in all four samples taken from April through September. One instance of gross alpha (20.1 pci/l) was above the ARAR of 15 pci/l. Trichloroethene is consistently detected at this location. Levels of 6 µg/l and 13 µg/l were detected during the reporting period, exceeding the ARAR value of 5 µg/l. In addition, a third sample was estimated below the detection limit at 4 µg/l.

The quality of the footing drain water is the dominating factor when considering results from the french drain sump sampling. Methylene chloride was detected in a single sample over this period of sampling. A level of 29 µg/l was reported, but this compound was also found in the laboratory's blank (indicated by B qualifier).

3.0 FRENCH DRAIN MONITORING WELLS

The French Drain Performance Monitoring Plan (FDPMP) requires additional sample data for monitoring french drain performance. The FDPMP requires groundwater level measurements of designated french drain monitoring wells: 10092, 10192, 10392, 10492, 10592, 10692, 10792, 10892, 10992, 11092, 39991, 45391, 4887, 35691, 31491, and 4787 (see Figure 6). Additionally, quarterly water quality sampling of the wells is required. Results are provided in the following sections.

FOOTING DRAIN SAMPLE SUMMARY

	4/29/93 FT10004RG	6/11/93 FT10031RG	7/7/93 FT10053RG	8/4/93 FT10074RG	9/29/93 FT10094RG	ARAR	# OF SAMPLES	# ABOVE ARAR	MIN VALUE	MAX VALUE
Methylene Chloride	2 BJ	28 B	U	U	U	5	5	1	U	28 B
Acetone	U	13 B	U	U	U	50	5	0	13 B	13 B
1 1 Dichloroethene	U	U	U	U	U	5	5	0	U	U
1 1 Dichloroethane	U	U	U	U	U	7	5	0	U	U
1 2 Dichloroethane	U	U	U	U	U	5	5	0	U	U
1 1 1 Trichloroethane	U	U	U	U	U	5	5	0	U	U
Carbon Tetrachloride	U	U	U	U	U	200	5	0	U	U
1 1 2 Trichloroethane	U	U	U	U	U	5	5	0	U	U
Trichloroethane	U	U	U	U	U	5	5	0	U	U
Tetrachloroethene	4 J	U	U	U	U	5	5	0	U	4J
Toluene	U	U	U	U	U	2000	5	0	U	U
Aluminum	U	96.6 B	31.7 B	22.7 B	56.1 B	5000	5	0	U	96.6 B
Antimony	U	U	U	19.3 B	U	60	5	0	U	19.3 B
Arsenic	U	U	U	U	U	50	5	0	U	U
Barium	139 B	154 B	158 B	156 B	164 B	1000	5	0	139 B	164 B
Beryllium	U	47 B	U	U	12 B	100	5	0	U	12 B
Cadmium	U	U	U	U	U	10	5	0	U	U
Chromium	U	U	U	U	U	50	5	0	U	U
Copper	U	U	U	26 B	U	200	5	0	U	26 B
Iron	19.2 B	28.8 B	31.5 B	U	96 B	300	5	0	U	31.5 B
Lead	U	2.5 B	U	U	U	50	5	0	U	2.5 B
Lithium	26.0 B	16.0 B	14.8 B	17.5 B	13.8 B	2500	5	0	13.8 B	26.0 B
Manganese	U	2.7 B	U	1.3B	U	50	5	0	U	2.7 B
Mercury	U	U	U	U	U	2	5	0	U	U
Molybdenum	U	U	U	U	U	100	5	0	U	U
Nickel	U	U	U	U	U	200	5	0	U	U
Selenium	16 B	U	38 B	36 B	24 B	10	5	0	U	38 B
Silver	U	U	U	U	U	50	5	0	U	U
Thallium	U	U	U	U	U	10	5	0	U	U
Vandium	2.8 B	7.2 B	U	U	U	100	5	0	U	7.2 B
Zinc	34.3	52	48.9	29.2	37.3	2000	5	0	29.2	52
Total Dissolved Solids	526 mg/l	589 mg/l	510 mg/l	470 mg/l	500 mg/l	400 mg/l	5	5	470 mg/l	589 mg/l
Chloride	102 mg/l	102 mg/l	120 mg/l	110 mg/l	110 mg/l	250 mg/l	5	0	102 mg/l	120 mg/l
Nitrate/Nitrite	6.84 mg/l	7.6 mg/l	6.6 mg/l	6.7 mg/l	6.3 mg/l	10 mg/l	5	0	6.3 mg/l	7.6 mg/l
Sulfate	37.0 mg/l	38.3 mg/l	44 mg/l	47 mg/l	45 mg/l	250 mg/l	5	0	37.0 mg/l	47.0 mg/l

FIGURE 3

FOOTING DRAIN SAMPLE SUMMARY

	4/29/93	6/11/93	7/7/93	8/4/93	9/29/93	ARAR	# OF SAMPLES	# ABOVE ARAR	MIN VALUE	MAX VALUE
Gross Alpha	7 44 pci/l	ANC	5 393 pci/l	5 131 pc/l	ANC	15 pci/l	3	0	5 131 pci/l	7 44 pci/l
Error	2 7		2 377	2 311					2 311	2 7
Gross Beta	5 88 pci/l	ANC	4 868 pci/l	4 213 pci/l	ANC	50 pci/l	3	0	4 213 pci/l	5 88 pci/l
Error	2 46		1 308	1 343					1 343	2 46
Uranium (233,234,235,238)	NS	ANC	7 007 pci/l	7 541 pci/l	ANC	40 pc/l	2	0	7 007 pci/l	7 541 pci/l
Error			0 753	1 463					0 0753	1 463
Strontium	0 344 pci/l	ANC	0 109 pci/l	177 pci/l	ANC	8 pci/l	3	0	109 pci/l	344 pci/l
Error	0 417		0 143	0 158					0 143	0 417
Plutonium	(0 00152) pci/l	ANC	0 003 pci/l	002 pci/l	ANC	15 pci/l	3	0	(00152) pci/l	003 pci/l
Error	0 00137		0 003	0 009					0 00137	0 003
Americium	0 00333 pci/l	ANC	0 022 pci/l	001 pci/l	ANC	4 pci/l	3	0	001 pci/l	022 pci/l
Error	0 00457		0 007	0 002						
Tritium	55 9 pci/l	ANC	79 650 pci/l	52 96 pci/l	ANC	20000 pci/l	3	0	52 96 pc/l	79 650 pci/l
Error	243		132 378							

ANC-ANALYSIS NOT COMPLETE

B (VOLATILES)-PARAMETER ALSO FOUND IN LABORATORY BLANK

B (METALS)-LESS THAN METHOD DETECTION LIMIT BUT GREATER THAN OR EQUAL TO INSTRUMENT DETECTION LIMIT

J-VALUE ESTIMATED BELOW DETECTION LIMIT

U-PARAMETER NOT DETECTED

NS- NOT SAMPLED

Note Results are in UG/L unless specified

Note Preliminary data not validated

FIGURE 3

FRENCH DRAIN SUMP SAMPLE SUMMARY

	6/11/93 FT10035RG	7/7/93 FT10056RG	8/4/93 FT10075RG	9/29/93 FT10096RG	ARAR	# OF SAMPLES	# ABOVE ARAR	MIN VALUE	MAX VALUE
Methylene Chloride	29 B	U	U	U	5	4	1	U	29 B
Acetone	7 BJ	U	U	U	50	4	0	U	7 BJ
1 1 Dichloroethene	U	U	U	U	5	4	0	U	U
1 1 Dichloroethane	U	U	U	U	7	4	0	U	U
1 2 Dichloroethane	U	U	U	U	5	4	0	U	U
1 1 1 Trichloroethane	U	U	U	U	5	4	0	U	U
Carbon Tetrachloride	U	U	U	U	200	4	0	U	U
1 1 2 Trichloroethane	U	U	U	U	5	4	0	U	U
Trichloroethene	U	U	U	U	5	4	0	U	U
Tetrachloroethene	2 J	1 J	U	U	5	4	0	U	2 J
Toluene	U	U	U	U	2000	4	0	U	U
Aluminum	47 4 B	39 4 B	32 2 B	ANC	5000	3	0	32 2 B	47 4 B
Antimony	U	U	U	ANC	60	3	0	U	U
Arsenic	33 B	2 4 B	67 B	ANC	50	3	0	2 4 B	67 B
Barium	189 B	165 B	168 B	ANC	1000	3	0	165 B	189 B
Beryllium	U	U	U	ANC	100	3	0	U	U
Chromium	U	U	U	ANC	10	3	0	U	U
Copper	U	U	U	ANC	50	3	0	U	U
Iron	U	13 9 B	37 B	ANC	200	3	0	U	37 B
Lead	8 4	10 B	310 B	ANC	300	3	0	U	310 B
Lithium	15	15 6 B	15 B	ANC	50	3	0	10 B	8 4
Manganese	22 B	U	19 5 B	ANC	2500	3	0	15	19 5 B
Mercury	U	U	11 B	ANC	50	3	0	U	22 B
Molybdenum	U	U	U	ANC	2	3	0	U	U
Nickel	U	U	U	ANC	100	3	0	U	U
Selenium	8 5 B	7 9 B	U	ANC	200	3	0	U	U
Silver	U	U	7 7	ANC	10	3	0	7 7	8 5 B
Thallium	U	U	U	ANC	50	3	0	U	U
Vanadium	47 B	U	U	ANC	10	3	0	U	U
Zinc	70 3	68 1	137	ANC	100	3	0	U	47 B
					2000	3	0	68 1	137
Total Dissolved Solids	575 mg/l	530 mg/l	520 mg/l	510 mg/l	400 mg/l	4	4	510 mg/l	575 mg/l
Chloride	102 mg/l	110 mg/l	110 mg/l	110 mg/l	250 mg/l	4	0	102 mg/l	110 mg/l
Nitrate/Nitrite	71 mg/l	62 mg/l	62 mg/l	58 mg/l	10 mg/l	4	0	58 mg/l	71 mg/l
Sulfate	47 8 mg/l	52 mg/l	62 mg/l	56 mg/l	250 mg/l	4	0	47 8 mg/l	62 mg/l

FIGURE 4

FRENCH DRAIN SUMP SAMPLE SUMMARY

	6/11/93 FT10036RG	7/7/93 FT10058RG	8/4/93 FT10075RG	9/29/93 FT10096RG	ARAR	# OF SAMPLES	# ABOVE ARAR	MIN VALUE	MAX VALUE
Gross Alpha Error	ANC 2 195	4 106 pci/l 2 195	1 697 pc/l 1 377	ANC	15 pci/l	2	0	1 697 pci/l 1 377	4 106 pci/l 2 195
Gross Beta Error	ANC 1 355	3 849 pci/l 1 355	3 517 pci/l 1 302	ANC	50 pci/l	2	0	3 517 pci/l 1 302	3 849 pci/l 1 355
Uranium (233,234,235, 238) Error	ANC 0 847	7 734 pci/l 0 847	8 198 pci/l 1 464	ANC	40 pci/l	2	0	7 734 pci/l 0 847	8 198 pci/l 1 464
Strontium Error	ANC 0 109	(011) pci/l 0 109	0 027 pci/l 0 104	ANC	8 pci/l	2	0	(011) pci/l 0 109	0 027 pci/l 0 104
Plutonium Error	ANC 0 071	453 pci/l 0 071	(003) pci/l 0 004	ANC	15 pci/l	2	0	(003) pci/l 0 004	453 pci/l 0 071
Americium Error	ANC 0 002	(001) pci/l 0 002	001 pci/l 0 007	ANC	4 pci/l	2	0	(001) pci/l 0 002	001 pci/l 0 007
Tritium Error	ANC 135 495	137 7 pci/l 135 495	35 660 pci/l 139 807	ANC	20000 pci/l	2	0	35 660 pci/l 139 807	137 7 pci/l 135 495

B (VOLATILES) PARAMETER ALSO FOUND IN LABORATORY BLANK
B (METALS)-LESS THAN METHOD DETECTION LIMIT BUT GREATER THAN OR EQUAL TO INSTRUMENT DETECTION LIMIT
ANC-ANALYSIS NOT COMPLETE
J-VALUE ESTIMATED BELOW DETECTION LIMIT
U-PARAMETER NOT DETECTED
NS-NOT SAMPLED

Note Results are n UG/L unless specified
Note Preliminary data not validated

FIGURE 4

COLLECTION WELL SAMPLE SUMMARY

	4/29/93 FT1005RG	6/11/93 FT10033RG	7/7/93 FT10055RG	8/4/93 FT10076RG	ARAR	# OF SAMPLES	# ABOVE ARAR	MIN VALUE	MAX VALUE
Methylene Chloride	U	ANC	U	U	5	3	0	U	U
Acetone	U	ANC	U	U	50	3	0	U	U
1 1 Dichloroethene	U	ANC	U	U	5	3	0	U	U
1 1 Dichloroethane	U	ANC	U	U	7	3	0	U	U
1 2 Dichloroethane	U	ANC	U	U	5	3	0	U	U
1 1 1 Trichloroethane	U	ANC	U	U	5	3	0	U	U
Carbon Tetrachloride	U	ANC	U	U	200	3	0	U	U
1 1 2 Trichloroethane	U	ANC	U	U	5	3	0	U	U
Trichloroethene	6	ANC	4J	13	5	3	2	U	13
Tetrachloroethene	U	ANC	U	2J	5	3	0	U	2J
Toluene	U	ANC	U	U	2000	3	0	U	U
Aluminum	U	U	293 B	492 B	5000	4	0	U	492 B
Antimony	U	U	U	U	60	4	0	U	U
Arsenic	14 B	23 B	16 B	U	50	4	0	U	23 B
Barium	46 B	52 B	50 B	53 B	1000	4	0	48 B	53 B
Beryllium	U	U	U	U	100	4	0	U	U
Cadmium	U	U	U	U	10	4	0	U	U
Chromium	U	42 B	U	U	50	4	0	U	42 B
Copper	U	U	25 B	34 B	200	4	0	U	34 B
Iron	U	51 B	170	23 B	300	4	0	U	170
Lead	17 B	23 B	U	U	50	4	0	U	23 B
Lithium	250 B	284 B	237 B	267 B	2500	4	0	237 B	284 B
Manganese	U	U	U	13 B	50	4	0	U	13 B
Mercury	U	U	U	U	2	4	0	U	U
Molybdenum	U	U	U	U	100	4	0	U	U
Nickel	U	U	U	U	200	4	0	U	U
Selenium	572	470	542	635	10	4	4	470	635
Silver	U	U	U	38 B	50	4	0	U	38 B
Thallium	U	U	U	U	10	4	0	U	U
Vanadium	170 B	216 B	U	U	100	4	0	U	216 B
Zinc	375	559	715	733	2000	4	0	375	733
Total Dissolved Solids	815 mg/l	771 mg/l	730 mg/l	830 mg/l	400 mg/l	4	4	730 mg/l	830 mg/l
Chloride	177 mg/l	175 mg/l	180 mg/l	210 mg/l	250 mg/l	4	0	175 mg/l	210 mg/l
Nitrate/Nitrite	576 mg/l	60 mg/l	47 mg/l	61 mg/l	10 mg/l	4	0	47 mg/l	61 mg/l
Sulfate	213 mg/l	215 mg/l	230 mg/l	240 mg/l	250 mg/l	4	0	213 mg/l	240 mg/l

FIGURE 5

COLLECTION WELL SAMPLE SUMMARY

	4/29/93 FT10005RG	6/11/93 FT10034RG	7/7/93 FT10055RG	8/4/93 FT10076RG	ARAR	# OF SAMPLES	# ABOVE ARAR	MIN VALUE	MAX VALUE
Gross Alpha Error	20.1 pci/l 6.1	ANC	5.393 pci/l 2.377	9.628 pci/l 2.652	15 pci/l	3	1	5.393 2.377	20.1 6.1
Gross Beta Error	6.88 pci/l 2.24	ANC	4.868 pci/l 1.308	0.867 pci/l 1.124	50 pci/l	3	0	0.867 1.124	6.88 2.24
Uranium (233, 234, 235, 238) Error	NS	ANC	7.007 pci/l 0.753	17.978 pci/l 2.557	40 pci/l	2	0	7.007 0.753	17.978 2.557
Strontium Error	0.0857 pci/l 0.326	ANC	0.109 pci/l 0.143	0.046 pci/l 0.121	8 pci/l	3	0	0.046 0.121	0.109 0.143
Plutonium Error	0.00178 pci/l 0.00347	ANC	0.003 pci/l 0.003	(.001) pci/l 0.003	15 pci/l	3	0	(.001) 0.003	0.003 0.003
Americium Error	0.00406 pci/l 0.00403	ANC	0.022 pci/l 0.007	0 pci/l 0.001	4 pci/l	3	0	0 0.001	0.022 0.007
Tritium Error	(.122) pci/l 234	ANC	79.65 pci/l 132.378	49.42 pci/l 139.062	20000 pci/l	3	0	(.122) 234	79.65 132.378

ANC-ANALYSIS NOT COMPLETE

B (VOLATILES)-PARAMETER ALSO FOUND IN LABORATORY BLANK

B (METALS)-LESS THAN METHOD DETECTION LIMIT BUT GREATER THAN OR EQUAL TO INSTRUMENT DETECTION LIMIT

J-VALUE ESTIMATED BELOW DETECTION LIMIT

U-PARAMETER NOT DETECTED

NS-NOT SAMPLED

Note Results are in UG/L unless specified

Note Preliminary data not validated

FIGURE 5

3 1 WATER LEVELS

Groundwater level measurements were taken throughout the duration of the second quarter. A summary table of the measurements taken throughout the quarter is found in Figure 7. Note that 10492, 10592, and 10692 are located beyond or near the western termination of the french drain.

3 2 MONITORING WELL CONTAMINANTS

Sampling of the hillside monitoring wells continues as a performance check on the french drain. The following data reflects contaminants detected above ARAR that were not available in the April through June Quarterly Report (No data from current quarter available).

<u>WELL #</u>	<u>DATE</u>	<u>PARAMETER</u>	<u>RESULT</u>	<u>ARAR</u>
10492+	6/11/93	Gross Alpha	26 pci/l	15 pci/l
	6/11/93	Selenium	682 µg/l	10 µg/l
	6/11/93	Sulfate	360 mg/l	250 mg/l
	6/11/93	TDS	1100 mg/l	400 mg/l
10592+	6/17/93	Sulfate	340 mg/l	250 mg/l
	6/17/93	TDS	1200 mg/l	400 mg/l
	6/17/93	Selenium	164 µg/l	10 µg/l
10692+	6/11/93	Gross Alpha	18 pci/l	15 pci/l
	6/11/93	Sulfate	440 mg/l	250 mg/l
	6/11/93	TDS	1200 mg/l	400 mg/l
10992	6/11/93	Nitrate/Nitrite	30 mg/l	10 mg/l
31491	4/30/93	Chloride	260 mg/l	250 mg/l
	4/30/93	Sulfate	2300 mg/l	250 mg/l
	4/30/93	TDS	2100 mg/l	400 mg/l

Spiked recovery not within control limits for this parameter

+ These wells located near or beyond the western termination of the french drain

4 0 800 AREA SURFACE WATER MONITORING STATIONS

Surface water flowmeter data for the 800 parking lot area is shown in Figure 8. Flows represented in the figure are in millions of gallons per day. One sample was taken at the end of September and is currently being processed at the 881 labs. Results of this sample will be reported in the October through December 1993 Report. The accuracy at location GS20 is significantly affected by debris that rests in the bottom of the culvert. Values are given in millions of gallons per day.

WEEKLY WATER LEVELS

Well #	10092	10192	10292	10392	10492	10592	10692	10792	10892	10992	11092	31491	35691	45391	4787	4887
	Well elevations taken at the top of casing															
	5900 47	5924 3	5925 46	5932 05	5932 81	5937 93	5943 6	5917 1	5929 2	5898 56	5895 31	5905 03	5941 36	5894 2	5884 64	5911 41
	Depth (ft) to the bottom of well relative to top of casing															
	23 08	21 08	26 28	29 07	34 4	28 19	23 44	26 26	26 28	33 67	23 06	23 66	30 46	23 49	9 8	12 37
	Elevation at surface of water in well															
7/2/93	DRY	DRY	DRY	DRY	5902 31	5912 71	5938 55	5893 21	DRY	5866 56	5872 95	5883 58	5923 47	5870 7	5875 96	5902 26
7/9/93	DRY	DRY	DRY	DRY	5902 21	5913 51	5938 28	5893 42	DRY	5866 78	5873 03			5871 3		
7/15/93	DRY	DRY	DRY	DRY	5902 23	5914 05	5938 18	5893 54	DRY	5866 96	5873 11			5871 5		
7/23/93	DRY	DRY	DRY	DRY	5902 29	5912 11	5937 94	5892 44	DRY	5866 08	5872 75			5870		
7/30/93	DRY	DRY	DRY	DRY	5902 22	5912 77	5937 59	5892 84	DRY	5866 39	5872 87			5870 7		
8/6/93	DRY	DRY	DRY	DRY	5902 28	5913 43	5937 51	5893 11	DRY	5866 64	5872 97			5870 9		
8/13/93	DRY	DRY	DRY	DRY	5902 27	5913 95	5937 31	5893 25	DRY	5866 86	5873 07			5871 3		
8/18/93												5883 15				
8/20/93	DRY	DRY	DRY	DRY	5902 25	5914 47	5937 02	5893 36	DRY	5867 1	5873 21			5871 5		
8/24/93															5875 02	
8/27/93	DRY	DRY	DRY	DRY	5902 21	5914 88	5936 76	5893 42	DRY	5867 28	5873 27			5871 6		
9/3/93	DRY	DRY	DRY	DRY	5902 26	5915 24	5936 63	5893 47	DRY	5867 48	5873 4			5871 7		
9/7/93															DRY	
9/10/93	DRY	DRY	DRY	DRY	5902 26	5915 57	5936 45	5893 48	DRY	5867 65	5873 53			5871 9		
9/15/93													5923 06	5871 9		
9/17/93	DRY	DRY	DRY	DRY	5902 31	5915 98	5936 35	5893 52	DRY	5862 47	5873 67					
9/20/93								5893 5			5873 71					
9/22/93										5867 99				5871 9		
9/23/93					5902 31	5916 43	5936									
9/24/93	DRY	DRY	DRY	DRY					DRY							

FIGURE 7

July September 1993 Flow Totals (Day) Surface Water Division GS19, GS20, GS21, & Precipitation

Day	GS19 July	GS19 August	GS19 September	GS20 July	GS20 August	GS20 September	GS21 July	GS21 August	GS21 September	Precipitation July Day/TOT	Precipitation August Day/TOT	Precipitation Sep Day/TOT
1	0.0000	0.0010	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.190
3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0500	0.0000
5	0.0000	0.0000	0.0000	0.0000	0.0020	0.0000	0.0000	0.0005	0.0030	0.0000	0.1500	0.100
6	0.0000	0.0000	0.0000	0.0000	0.0020	0.0000	0.0000	0.0005	0.0030	0.0000	0.1100	0.040
7	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.370
8	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.010
9	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.000
10	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.000
11	0.0015	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.000
12	0.0004	0.0000	0.0000	0.0040	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.000
13	0.0003	0.0000	0.0000	0.0030	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0100	0.000
14	0.0020	0.0000	0.0000	0.0020	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.270
15	0.0000	0.0000	0.0000	0.0090	0.0000	0.0043	0.0000	0.0000	0.0000	0.0000	0.0000	0.200
16	0.0000	0.0000	0.0000	0.0000	0.0000	0.0012	0.0000	0.0000	0.0000	0.0000	0.0000	0.970
17	0.0000	0.0000	0.0000	0.0000	0.0000	0.0016	0.0000	0.0000	0.0000	0.0000	0.0000	0.140
18	0.0000	0.0000	0.0000	0.0000	0.0000	0.0005	0.0000	0.0000	0.0000	0.0000	0.0000	0.020
19	0.0000	0.0000	0.0000	0.0000	0.0000	0.0020	0.0000	0.0000	0.0000	0.0000	0.0000	0.250
20	0.0000	0.0000	0.0000	0.0030	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.000
21	0.0015	0.0000	0.0000	0.0040	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0100	0.000
22	0.0010	0.0000	0.0000	0.0040	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0400	0.000
23	0.0000	0.0000	0.0000	0.0010	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.910
24	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.910
25	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.000
26	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.000
27	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.000
28	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0100	0.000
29	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0100	0.000
30	0.0010	0.0000	0.0000	0.0010	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.000
31	0.0000	0.0000	0.0000	0.0020	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.000
Totals	0.0069	0.0010	0.0290	0.0330	0.0040	0.0146	0.0000	0.0010	0.0219	0.5000	0.3900	1.920

1 GS21 9/14/93 Calibration Performed at 10 35 AM
2 GS21 7/3-7/93 Flow Meas Data m Calibrations Performed to
For Temperature Effects on Level measurements
3 GS20 9/13 18/93 Debris in 6 Culvert

AVG Daily Average / Hour
TOT Daily Totals

Note
Totals are in MGD
Precipitation Totals in Inches

FIGURE 8

5 0 TREATMENT FACILITY PERFORMANCE

The treatment system performance is measured by various criteria Quantity of water treated contamination destruction or removal efficiency waste generation operating costs chemical usage and system reliability

5 1 QUANTITY OF WATER TREATED

Approximately 166 000 gallons of groundwater were treated at the treatment facility during the past quarter In addition 82 000 gallons of water from T 205 were retreated through the ion exchange system in order to remove dissolved iron Approximately 150 000 gallons of treated effluent (see also Section 6 on Environmental Compliance) were released to the South Interceptor Ditch Approximately 1 600 000 gallons of groundwater have been processed through the system to date

5 2 WATER FROM OTHER SOURCES

An estimated 2 500 gallons of decontamination pad water was treated during the quarter The decontamination pad water required treatment at Building 891 due to low level (<10 ppb) volatile organics However when the water was processed for treatment sample results indicated no presence of volatile organics in the water

5 3 CONTAMINATION DESTRUCTION/REMOVAL EFFICIENCY

A comparison of the UV/peroxide influent and effluent samples was presented in the April through June 1993 Quarterly Report Additional information was not available to evaluate the UV/Peroxide unit performance since the last quarterly report

Influent and effluent sample results that were taken in April June and July across Ion Exchange Column #1 (uranium removal column) are shown in Figure 9 Raw data shows a reduction across the column for most all radionuclides

5 4 CHEMICAL USAGE

A total of 807 gallons of hydrochloric acid and 408 gallons of sodium hydroxide were used for regeneration and neutralization activities Approximately 10 gallons of hydrogen peroxide were used for the UV/Peroxide destruction unit

RAD REMOVAL ACROSS IX COLUMN #1

Date	Parameter	Inf Result	Inf error	Eff Result	Eff error
4/29/93	Gross alpha	6 199	2 082	0 212	1 178
	Gross Beta	4 351	1 022	3 736	0 906
	Ur 233 234	NS		NS	
	Ur 235	NS		NS	
	Ur 238	NS		NS	
	Sr 89 90	0 071	0 157	0 02	0 19
	Pu 239 240	(002)	0 002	0 003	0 005
	Am 241	0 002	0 005	(001)	0 004
	Cs 137	(134)	0 108	(085)	0 097
	Tritium	127	152 723	54 08	148 392
6/11/93	Gross alpha	3 607	1 754	(1 155)	1 57
	Gross Beta	4 096	0 814	3 455	0 757
	Ur 233 234	NS		NS	
	Ur 235	NS		NS	
	Ur 238	NS		NS	
	Sr-89 90	0 103	0 199	0 147	0 202
	Pu 239 240	(017)	0 033	0 023	0 046
	Am 241	0 001	0 004	0 001	0 003
	Cs 137	(036)	0 153	0 043	0 117
	Tritium	31 97	146 216	177	155 31
7/7/93	Gross alpha	4 4	2 1	0 16	1 4
	Gross Beta	2 3	1 5	1 5	1 2
	Ur 233 234	4 3	0 78	(047)	0 0936
	Ur 235	0 11	0 11	0	0 056
	Ur 238	3 3	0 65	0 023	0 047
	Sr 89 90	(013)	0 15	0 076	0 11
	Pu 239 240	0 002	0 003	(001)	0 004
	Am 241	0 002	0 004	0	0 003
	Cs 137	(11)	0 1	0 007	0 099
	Tritium	140	150	250	160

ALL VALUES IN PCI/L

NS NOT SAMPLED

5 5 POWER USAGE

Since start up in April 1992 the power used by the facility was approximately 290 000 KWH (kilo watt hours) The estimated cost for power at the facility was \$22/day (approximately \$12 000 over the life of the project)

5 6 WASTE GENERATION

Waste generated at the treatment facility includes sock filters and neutralized regenerant water Less than one 55 gallon drum of sock filters has been generated in 18 months of operation It is currently expected that the sediment from the sock filters can be drummed and the sock filters surveyed and taken to the landfill This action would reduce the amount of drummed waste by at least 90% Eight tanker truck loads of neutralized regenerant water from Tank T 210 (30 000 gallons) were sent to the 374 evaporator

5 7 OPERATING COSTS

Subcontracted operating costs for this quarter totaled approximately \$40 000 These costs include chemical purchases spare parts labor and document preparation Some additional scope was added to the contract in order to increase upper management oversight and add a part time individual devoted to sampling activities

5 8 MAINTENANCE

The repaired french drain flow totalizer was reinstalled into the French Drain Sump discharge line However after several attempts to verify the accuracy of the totalizer it was found that unit was again not functioning correctly Flowmeters throughout the system have proven to be unreliable Calculations of tank dropout and comparison to the UV/Peroxide flowmeter show a 25% discrepancy Magnetic flow meters have been ordered and will be installed in order to provide a more accurate measure of the influent feed into the system

The heater contact on one phase of Pump P 102 starter (french drain sump pump) was malfunctioning It is uncertain what the exact cause of the problem was however EG&G maintenance was able to bring the pump back into operational status

The compressor and transducer that relay french drain water level information to the building logic controller were replaced due to failure

The pump P 210 (Neutraization Tank transfer pump) impeller seized up around the shaft and was replaced

Some problems with the lightning strike in July still remain an issue. Parts are on order but have not yet been received in order to correct the situation. In addition, some troubleshooting on the building logic controller is periodically required.

Problems with the pH sensors in the ion exchange system experienced last quarter seem to be resolved. All pH sensors are now functional. Modifications to the system are planned in order to make calibration easier.

6 0 TREATMENT FACILITY SAMPLING

Water samples are taken at OU 1 to characterize the influent groundwater, assure that neutralization water from regeneration of the ion exchange system is acceptable for the 374 evaporator, monitor the ion exchange resin performance, and verify that all discharge standards are met. Water that is sent to the 374 evaporator is analyzed for pH and gross alpha in the 881 general labs. Sampling results for the three hillside locations and the radionuclide removal across ion exchange column #1 are presented in Figures 3, 4, 5, and 9.

7 0 ENVIRONMENTAL COMPLIANCE

On August 26, 1993, approximately 50,000 to 60,000 gallons of treated effluent water were released from effluent tank T 207. This was an unplanned release due to the fact that the samples previously taken had not yet been analyzed and the data verified at the time of the discharge. The circumstances of the release involved a discharge valve that was inadvertently left open on T 207 while T 206 was discharging.

As a corrective action, the treatment facility was shut down for a one week period in order to prepare operating procedures for critical facility operations. The Building 891 operations subcontractor satisfactorily completed draft Standard Operating Procedures (SOPs) for basic operations of the treatment facility during the one week period. A shift order was issued to allow the subcontractor to work under the draft SOPs while the final approval process is completed.

Results of the released waters indicate that all parameters were below ARAR with the exception of iron. The total iron content was found to be 357 mg/l and the dissolved iron content was 34 mg/l. The ARAR for dissolved iron is 3 mg/l. The remaining water was retreated and placed into another tank to be sampled before discharge.

8 0 REPORTS AND CORRESPONDENCE

The Site Specific Health and Safety Plan was revised and approved on September 30, 1993.

The subcontractor satisfactorily completed draft SOP's for specific operations at the treatment facility. The approval process is expected to take several months.

The case is still being developed to discontinue the collection of the 881 footing drain. A presentation to the DOE will be prepared when all documentation is in place.

9 0 ANTICIPATED OPERATIONS FOR NEXT QUARTER

Normal operations will continue through the end of the calendar year. Some periods of high flows should be experienced due to winter weather conditions. Some overtime may be necessary to keep up with increased flows.

It is anticipated that the installation of the gas chromatograph will begin in Mid November. Several items of concern are still being discussed with the vendor in order to eliminate problems when the equipment is ready for installation.

10 0 SUMMARY/CONCLUSIONS

The volume of water treated this past quarter is significantly lower than that of last quarter. It is expected that the volume of water treated during the next quarter will be significantly greater due to winter weather conditions. Overall 166 000 gallons of groundwater were treated this past quarter and approximately 100 000 gallons of treated effluent were released.

The unanticipated release of 50 000 60 000 gallons of water resulted in significant changes in operations. Operation specific procedures were developed and more checks have been put into the system to avoid future difficulties.

The installation of the gas chromatograph in November/December will bring significant real time analysis capabilities to the treatment facility. Several months of systems testing will be needed to verify the effectiveness of the unit.

A decision in favor of the discontinuation of the 881 footing drain would significantly affect operations. A significant reduction to current and outyear funding would be encountered should this source be eliminated.

